

NASA KSC Export Control Office (ECO)

Export/SBU Determination Record

EDDR# 09 223

Title of Document:

Electrical Power Receptacles and Plugs, Standard For
KSC-STD-E-0011H, January 7, 2009

SENSITIVE BUT UNCLASSIFIED (SBU)

INSTRUCTIONS: This item must be reviewed under the requirements for "Sensitive But Unclassified Information" as described in NPR 1600.1, Chapter 5. <http://nodis-dms.gsfc.nasa.gov>

Material that is export-sensitive is automatically considered to contain SBU and does not require an SBU Reviewer signature. Material that is not export-sensitive must be reviewed for SBU as required per NASA Form 1686.

	Yes	No	SBU Reviewer's Signature	Date
Document contains SBU?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CLARENCE RANOW (4/9/2009)	04/07/2009

EXPORT CONTROL (EC)

INSTRUCTIONS: If the document includes export-controlled data, contact your directorate Export Control Representative or the KSC ECO Help Desk (867-9209) for a determination of the proper export category.

<http://exportcontrol.ksc.nasa.gov/>

ECO Reviewer's Name and Organization	ECO Reviewer's Signature	Date
C. Wayne Ranow, NASA, KSC ECO	CLARENCE RANOW (4/9/2009)	04/07/2009

EXPORT DETERMINATION <i>(Check one box only)</i>		
EAR 99 NLR (No EC)	<input checked="" type="checkbox"/>	The information contained in the document is technical in content, but is not technical data as defined by the ITAR or the EAR, and therefore is EAR 99 NLR (no export license required). [General Prohibition Six (Embargo) applies to all items subject to the EAR, i.e. items on the CCL and within EAR 99 NLR. You may not make an export or re-export contrary to the provisions of part 746 (Embargos and Other Special Controls) of the EAR and 22 CFR part 126.1 of the ITAR.]
EAR Controlled	<input type="checkbox"/>	This document is within the purview of the Export Administration Regulations (EAR), 15 CFR 730-774, and is export controlled. It may <u>not</u> be transferred to foreign nationals in the U.S. or abroad without specific approval of a knowledgeable NASA export control official, and/or unless an export license or license exception is obtained/available from the Bureau of Industry and Security, United States Department of Commerce. Violations of these regulations are punishable by fine, imprisonment, or both.
ITAR Controlled	<input type="checkbox"/>	This document contains information which falls under the purview of the U.S. Munitions List (USML), as defined in the International Traffic in Arms Regulations (ITAR), 22 CFR 120-130, and is export controlled. It shall not be transferred to foreign nationals, in the U.S. or abroad, without specific approval of a knowledgeable NASA export control official, and/or unless an export license or license exemption is obtained/available from the United States Department of State. <i>Violations of these regulations are punishable by fine, imprisonment, or both.</i>

KSC-STD-E-0011H

January 7, 2009

Supersedes

KSC-STD-E-0011G

June 7, 2000

**ELECTRICAL POWER RECEPTACLES
AND PLUGS,
STANDARD FOR**

CENTER OPERATIONS DIRECTORATE

National Aeronautics and
Space Administration

John F. Kennedy Space Center

KSC FORM 16-12 (REV. 6/95) PREVIOUS EDITIONS ARE OBSOLETE (CG 11/95)



KSC-STD-E-0011H

January 7, 2009

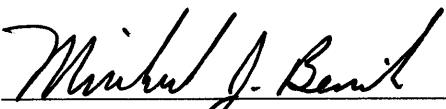
Supersedes

KSC-STD-E-0011G

June 7, 2000

**ELECTRICAL POWER RECEPTACLES
AND PLUGS,
STANDARD FOR**

Approved:



Michael J. Berk
Director, Center Operations

JOHN F. KENNEDY SPACE CENTER, NASA

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.	SCOPE	1
2.	APPLICABLE DOCUMENTS.....	1
2.1	Governmental.....	1
2.1.1	Standards.....	1
2.2	Nongovernmental.....	2
3.	REQUIREMENTS.....	2
3.1	Grouping	2
3.2	Utilization of Tables	2
3.2.1	Service.....	2
3.2.2	Rating.....	2
3.2.3	Symbol	3
3.2.4	Wiring Diagram – Facility	3
3.2.4.1	Receptacle	3
3.2.4.2	Plug	3
3.2.5	Wiring Diagram - Ground Support Equipment (GSE)	3
3.2.5.1	Plug	3
3.2.5.2	Receptacle	3
3.2.6	Catalog Number	3
3.2.7	Insert Representation.....	3
3.2.8	Reverse Service.....	4
3.2.9	Limitations	4
3.3	Abbreviations	4
3.4	Request for Waivers.....	4
3.4.1	Requests	4
3.4.2	Construction Contractor.....	4
3.5	Ordering Data.....	4
4.	QUALITY ASSURANCE PROVISIONS.....	5
4.1	Supplier	5
4.2	Construction Contractor.....	5

TABLE OF CONTENTS (cont)

<u>Section</u>	<u>Title</u>	<u>Page</u>
5.	PREPARATION FOR DELIVERY	6
6.	NOTES.....	6
6.1	Special Hazardous Conditions Requirement	6
6.2	Intended Use	6

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
1	Nonhazardous Area (Indoor/Outdoor) Receptacles	7
2	Hazardous Area, Class 1, Division 1, Group B, C, D Explosionproof Receptacles	20
3	Hazardous Area, Class 1, Division 1, Group C, D Explosionproof Receptacles	25
4	Not To Be Used for New Design [Nonhazardous Area (Indoor/ Outdoor) Receptacles]	28
5	Receptacle/Plug Cross-Reference Chart	36

ABBREVIATIONS AND ACRONYMS

AH	Arrow Hart
AP	Appleton
CH	Crouse Hinds
dc	Direct Current
GSE	Ground Support Equipment
HU	Hubbell
Hz	Hertz
KSC	John F. Kennedy Space Center
ME	Meltric
NCL	Not Catalog Listed
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
PN	Pyle National
RS	Russellstoll
VT	Vantage Technology
WP	Waterproof
WT	Watertight
NASA	National Aeronautics and Space Administration

ELECTRICAL POWER RECEPTACLES AND PLUGS,
STANDARD FOR

1. SCOPE

This standard is to be used by the John F. Kennedy Space Center (KSC) design and maintenance organizations for internal operations and as a technical document to specify requirements in KSC design contracts. This standard (1) identifies those electrical power receptacles that shall be used when designing new or modifying existing facilities and identifies receptacles that shall be used for installation on portable ground support equipment, (2) establishes a standard for symbols to be used in drawings, and (3) provides pertinent data for each receptacle. Receptacles included are for 60-hertz (Hz) applications in hazardous and nonhazardous areas. The term "receptacle" in this sense shall be understood to include plugs, which are also identified by this Standard.

2. APPLICABLE DOCUMENTS

The following documents form a part of this document to the extent specified herein. When this document is used for procurement, including solicitations, or is added to an existing contract, the specific revision levels, amendments, and approval dates of said documents shall be specified in an attachment to the Solicitation/Statement of Work/Contract.

2.1 Governmental

2.1.1 Standards

John F. Kennedy Space Center (KSC), National Aeronautics and Space Administration

KSC-STD-E-0002

Hazardproofing of Electrically Energized
Equipment, Standard for

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specified procurement functions should be obtained from the procuring activity or as directed by the Contracting Officer.)

2.2 Nongovernmental

National Fire Protection Association (NFPA)

NFPA 70

National Electrical Code (NEC)

(Application for copies should be addressed to the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.)

National Electrical Manufacturers Association (NEMA)

NEMA WD-1

General Purpose Wiring Devices

NEMA WD-6

Wiring Devices – Dimensional
Specifications

(Application for copies should be addressed to the National Electrical Manufacturers Association, 155 East 44th Street, New York, NY 10017)

3. REQUIREMENTS

3.1 Grouping - The receptacles have been grouped by intended application, as follows:

- a. Nonhazardous areas - Table 1
- b. Hazardous areas Class I, Division 1, Groups B, C, and D - Table 2
- c. Hazardous areas Class I, Division 1, Groups C and D - Table 3

3.2 Utilization of Tables - To properly utilize the above-referenced tables, the following explanatory information is given. Note that the voltage rating shown in the table heading may be lower than the manufacturer's stated voltage.

3.2.1 Service - The application tables have been subdivided to indicate the service for which each group of receptacles was selected. This service is indicated by voltage, frequency, and number of phases, wires, and poles.

3.2.2 Rating - The information shown in the rating column is the maximum allowable amperage of each receptacle, plus other applicable data.

3.2.3 Symbol - The information shown in the symbol column applies only to facility receptacles and shall be shown on the drawing and in the legend with rating. The legend shall also include all requirements of this standard and referenced documents. As an alternate method, the requirements of this standard may be included in the contract specification, in which case the contract shall be referenced in the legend.

3.2.4 Wiring Diagram – Facility

3.2.4.1 Receptacle - The devices shown in the receptacle column will normally be installed in or on the wall of a fixed structure and fed from a load center or substation. Therefore, this receptacle is normally energized and shall have a female insert. The diagrams in this column show socket arrangement and assigned function such as ground, neutral, and phase.

3.2.4.2 Plug - The devices shown in the plug column will mate with the corresponding facility receptacles. The diagrams in this column show pin arrangement and assigned function such as ground, neutral, and phase.

3.2.5 Wiring Diagram - Ground Support Equipment (GSE)

3.2.5.1 Plug - These devices will usually be installed on the same cable as the plug listed under 3.2.4 Wiring Diagram - Facility. This cable and the plug will serve as an interface between the facility power source and the GSE load. If this cable is mated with the facility receptacle, the contacts of the GSE plug will be energized; therefore, this GSE plug must have a reverse service female insert. The diagrams in this column show pin arrangement and assignment.

3.2.5.2 Receptacle - The devices shown in the receptacle column will be installed on GSE and will serve as the connection point for power cables. Since the contacts of these receptacles are not exposed while energized, this GSE receptacle has a male insert. The diagrams in this column show pin arrangement and assignment.

3.2.6 Catalog Number - Receptacles and plugs are identified by listing one or more catalog numbers; however, all catalog numbers available for a specific insert and optional mounting configurations are not necessarily listed. The manufacturer's catalog should be consulted for specific technical information on alternative mounting configurations available for the listed receptacles and for the listed plugs. Receptacle and plug configuration other than those listed in this standard may be utilized as determined by specific application. However, no change is permitted in receptacle mating, pin arrangement, and keying for a particular service as listed in this standard by catalog number.

3.2.7 Insert Representation - The pins (male inserts) on receptacles and plugs are represented by shaded areas. The sockets (female inserts) on receptacles and plugs are represented by unshaded areas.

3.2.8 Reverse Service - In situations where the exposed pins of a plug selected for facility use would be energized when the receptacle and plug are disconnected, reverse-service connectors shall be used. The normal-usage symbol with a subscript letter "R" indicates reverse-service requirement. The plugs and receptacles for GSE use were selected to prevent the exposure of "energized" pins when the plugs and receptacles are not mated. The letters "S" and "P" appear frequently in part numbers. "S" indicates that the plug or receptacle has a female (socket) insert and the contacts are not exposed when this device is not mated to its counterpart. The "P" indicates that the plug or receptacle has a male (pin) insert and the contacts are exposed when the device is not mated to its counterpart.

3.2.9 Limitations - For reasons of unavailability, obsolescence, or product improvement, certain devices previously listed (which may remain in service) are no longer listed for new designs. These are shown in Table 4.

3.3 Abbreviations – See the Abbreviations and Acronyms List for the abbreviations used in the tables.

3.4 Requests for Waivers - The requirements set forth in this standard are not intended to be totally restrictive. The purpose is to achieve standardization of receptacles and plugs throughout KSC. Receptacles and plugs not listed in this Standard that are electrically and physically interchangeable with those identified in this Standard may be substituted if they are approved in writing by properly executed waivers. Requests for waivers of any requirements of this Standard must be supported by technical justification.

3.4.1 Requests – The KSC organization shall direct requests to:

Center Operations Directorate
Mechanical/Electrical Branch, Mail-code: TA-B3
John F. Kennedy Space Center, NASA
Kennedy Space Center, Florida 32899

3.4.2 Construction Contractors – The KSC construction contractors shall direct requests to the responsible administrative contracting officer:

Procurement Office
John F. Kennedy Space Center, NASA
Kennedy Space Center, Florida 32899

3.5 Ordering Data - When this Standard is referenced in a technical document in a KSC contract, the title and number of this standard shall be specified as a part of that document. Where NEMA configurations are shown, these devices shall be specification grade as manufactured by Hubbell, Pass and Seymour; General Electric; Arrow-Hart; Bryant; and others.

4. QUALITY ASSURANCE PROVISIONS

Designers preparing design specifications shall include inspection and test requirements to ensure the provisions of the specifications conform to all applicable requirements of this Standard. Both the supplier and the construction contractor shall establish a quality control system to perform sufficient inspection and tests of all items of work to ensure compliance with this Standard, NEMA standards, and NFPA 70 standard with respect to materials, workmanship, construction, and functional performance. When receptacles are purchased under the provisions of this Standard, the following minimum inspection and test requirements shall apply.

4.1 Supplier - The supplier shall:

- a. Inspect finished work for size, pin arrangement, and quality of workmanship.
- b. Provide protection and controls necessary to prevent damage or deterioration prior to packaging and shipping.
- c. Ensure the quality of the fabricated articles is maintained and damage, deterioration, loss, and substitution are prevented.
- d. Package and mark the finished articles in a manner to ensure safe arrival and ready identification at destination.

4.2 Construction Contractor - The construction contractor shall:

- a. Upon receipt, inspect to detect damage in transit.
- b. Inspect the complete assembly for proper type, size, and pin configuration.
- c. Provide the protection, periodic inspection, and controls necessary to prevent damage or deterioration during handling or storage.
- d. Conduct operating tests after the receptacle installation is complete and at such time as the Contracting Officer may direct and verify power supply voltage and proper connection of all receptacle pins. These tests shall include (but not be limited to) a continuity test between the receptacle grounding pin and earth ground (or objects known to be adequately grounded to the earth) by a path independent of the power neutral.
- e. Verify phase rotation for each three-phase receptacle by testing with a phase-rotation meter. The phase rotation for all three phase receptacles shall be as shown on the wiring diagram using the ground pin or neutral as a reference.

5. PREPARATION FOR DELIVERY

There are no applicable requirements.

6. NOTES

6.1 Special Hazardous Conditions Requirement - In addition to the NEC hazardous locations requirements, refer to KSC-STD-E-0002 Hazardproofing of Electrically Energized Equipment for special hazardous location requirements.

6.2 Intended Use - This Standard is intended for use in the selection of plugs and receptacles for new installation by KSC design and maintenance organizations and by designers performing under KSC contracts. It is not intended that existing plugs and receptacles be modified for the sole purpose of conforming to this standard.

NOTICE: The Government drawings, specifications, and/or data are prepared for the official use by, or on the behalf of, the United States Government. The Government neither warrants these Government drawings, specifications, or other data, nor assumes any responsibility or obligation, for their use for purposes other than the Government project for which they were prepared and/or provided by the Government, or an activity directly related thereto. The fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded, by implication or otherwise, as licensing in any manner the holder or any other person or corporation, nor conveying the right or permission, to manufacture, use, or sell any patented invention that may relate thereto.

CUSTODIAN:

NASA – John F. Kennedy Space Center
Kennedy Space Center, FL 32899

PREPARING ACTIVITY:

John F. Kennedy Space Center
Center Operations Directorate
Mechanical/Electrical Branch

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles

RATING	FACILITY SYMBOL	120V, 60 Hz, single phase, 3 wire, 2 pole			WIRING DIAGRAM - GSE
		RECEPTACLE	WIRING DIAGRAM - FACILITY	PLUG	
15A duplex (indoor only)					
15A duplex weatherproof (hinged flap cover)					
15A flush floor outlet (indoor only)					

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

		120V, 60 Hz, single phase, 3 wire, 2 pole (cont)			WIRING DIAGRAM - GSE	
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY RECEPTACLE	PLUG	PLUG	RECEPTACLE	
15A duplex (indoor only), locking					N/A	
20A duplex (indoor only)					N/A	
20A duplex weatherproof (hinged flap cover)					N/A	

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	PLUG	RECEPTACLE
20A waterproof		N O O 1 2 G	∅ N G		N/A N/A
		RS No. 3743	RS No. 3720		
20A locking (indoor only)		N ∅ G		N/A N/A	
		20	NEMA L5-20P		
30A weathertight		N ∅ 1 2 G		N/A N/A	
		WT	RS No. 3756	RS No. 3829	

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table I. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	RECEPTACLE	PLUG
30A waterproof		 RS No. 3753	 CH RPC121-150-S04AR RPC121-151-S04AR	 CH RPC221-127-P04AR	
30A locking general purpose (indoor only), use F symbol for floor mounting		 NEMA L5-30P	 N/A	 N/A	
50A TWIST-LOK, CORROSION RESISTANT		 HU No. HBL63CM70 AH63CR70	 HU No. HBL63CM61 AH63CR61N	 N/A	

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

120V, 60Hz, single phase, 3 wire, 2 pole					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY	RECEPTACLE	PLUG	WIRING DIAGRAM - GSE
15A combination (indoor only)					RECEPTACLE
15A (indoor only)					N/A
30A (indoor only)					N/A

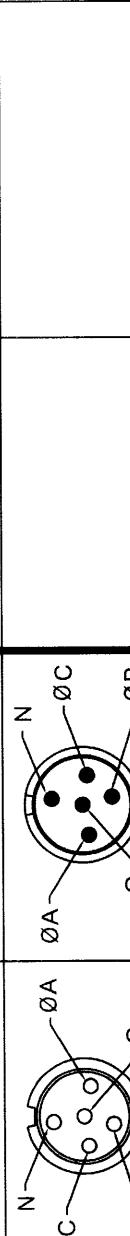
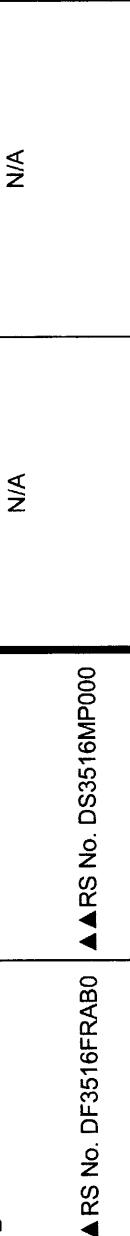
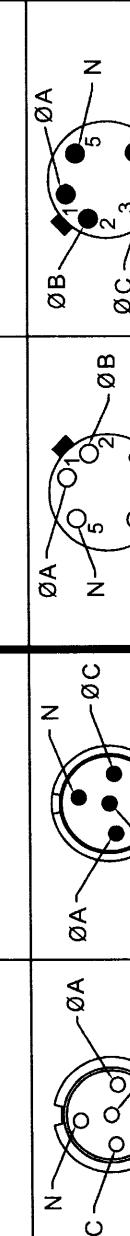
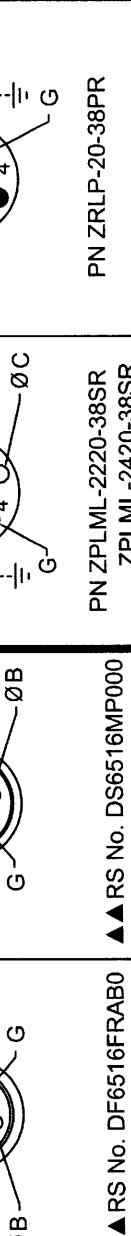
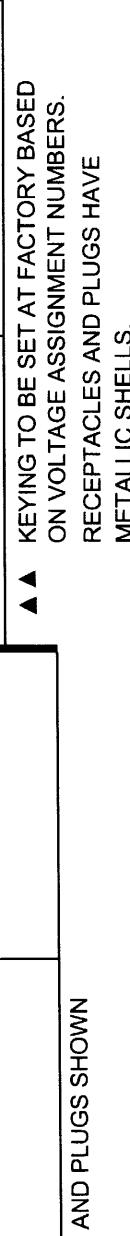
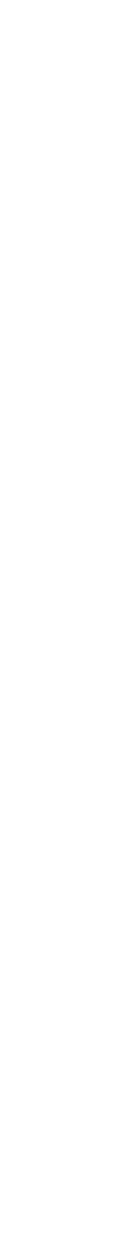
FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY RECEPTACLE		WIRING DIAGRAM - PLUG		WIRING DIAGRAM - GSE RECEPTACLE
		PLUG	RECEP	PLUG	RECEP	
30A, locking	208V 30 1-PH		N G		N/A N/A	N/A
30A weathertight	208V WT 30 1-PH		G N G		N/A N/A	N/A
60A weathertight	208V WT 60 1-PH		G N G		N/A N/A	N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

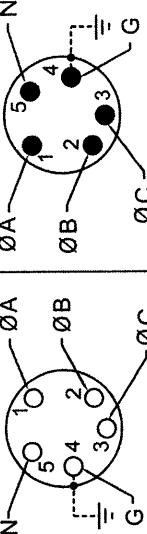
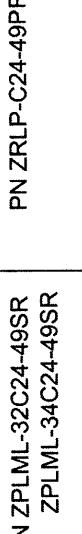
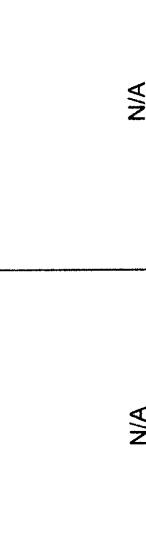
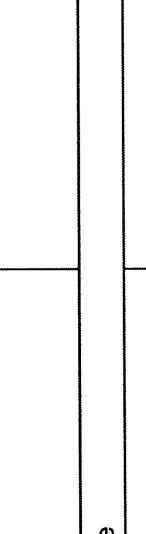
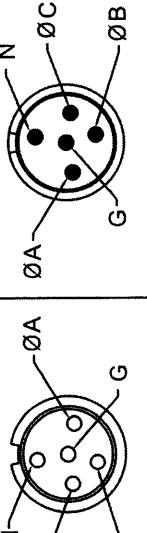
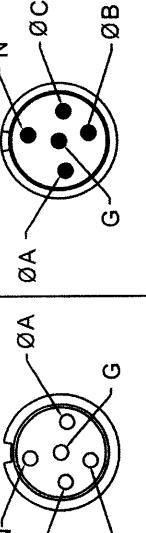
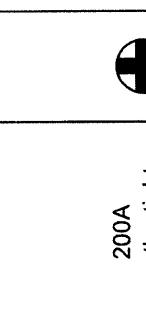
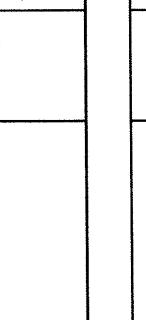
Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	PLUG	RECEPTACLE
30A (indoor only)	●			N/A	N/A
30A weathertight	WT			N/A	N/A
60A weathertight	WT				

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

▲ KEYING TO BE SET AT FACTORY BASED
ON VOLTAGE ASSIGNMENT NUMBERS.
RECEPTACLES AND PLUGS HAVE
METALLIC SHELLS.

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

120/208V, 60 Hz, 3 phase, 5 wire, 4 pole (cont)					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - RECEPTACLE	WIRING DIAGRAM - PLUG	WIRING DIAGRAM - GSE	RECEPTACLE
100A weathertight	WT				
200A weathertight	WT				
20A weathertight	WT				

▲ KEYING TO BE SET AT FACTORY BASED
ON VOLTAGE ASSIGNMENT NUMBERS.
RECEPTACLES AND PLUGS HAVE
METALLIC SHELLS.

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Note: 1 Rated at 600V AC

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

480V, 60 Hz, 3 phase, 4 wire, 3 pole (cont)					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	PLUG	RECEPTACLE
30A weathertight 45° angle flap cover	WT				
60A weathertight 45° angle flap cover	WT				
100A weathertight 30° angle flap cover	WT				

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

▲▲ KEYING TO BE SET AT FACTORY BASED
ON VOLTAGE ASSIGNMENT NUMBERS.
RECEPTACLES AND PLUGS HAVE
METALLIC SHELLS.

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

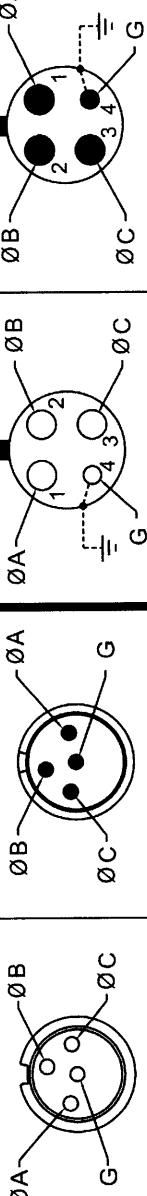
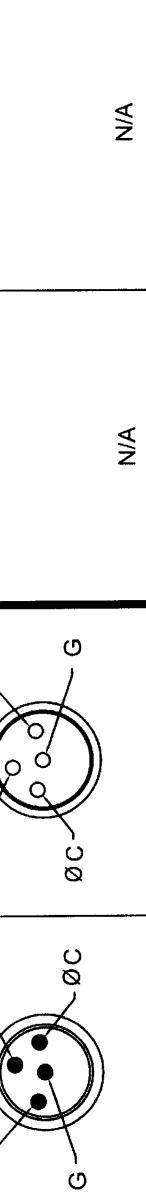
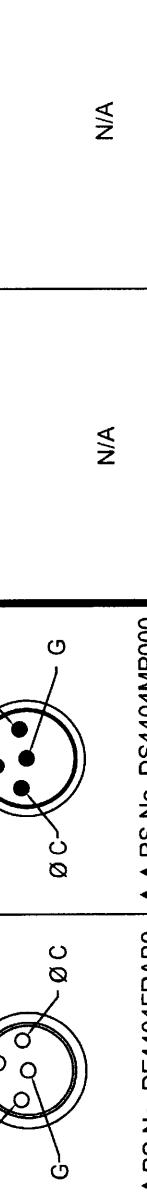
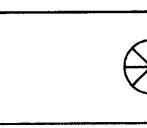
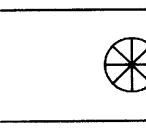
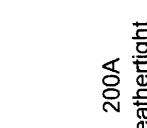
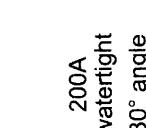
480V, 60 Hz, 3 phase, 4 wire, 3 pole (cont)					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - RECEPTACLE	WIRING DIAGRAM - PLUG	WIRING DIAGRAM - GSE	
200A weatheright 30° angle flap cover	WT				
				PN ZRLLP-C24-26PR	
200A watertight 30° angle with cup cap cover	WTR			N/A	
				N/A	
400A weatherlight 30° angle flap cover	WT			N/A	
				N/A	
 KEYING TO BE SET AT FACTORY BASED ON VOLTAGE ASSIGNMENT NUMBERS. RECEPTACLES AND PLUGS HAVE METALLIC SHELLS.					
FACE VIEW OF RECEPTACLES AND PLUGS SHOWN					

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

		480V, 60 Hz, 3 phase, 4 wire, 3 pole (cont)			
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	PLUG	RECEPTACLE
400A watertight 30° angle with cup cap cover					N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table 1. Nonhazardous Area (Indoor / Outdoor) Receptacles (cont)

RATING	FACILITY SYMBOL	250V, dc; 600V, 60 Hz; single phase, 4 wire, 3 pole		WIRING DIAGRAM - GSE RECEPTACLE
		WIRING DIAGRAM - FACILITY RECEPTACLE	PLUG	
60A waterproof with screw cap	(60) WP			N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table 2. Hazardous Area, Class I, Division 1, B, C, D Explosionproof Receptacles

120V, 60 Hz, single phase, 3 wire, 2 pole					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY RECEPTACLE	WIRING DIAGRAM - PLUG	WIRING DIAGRAM - GSE RECEPTACLE	
20A switch interlocked	E (BCD)			N/A	N/A
20A use switch interlocked (30A actual rating of receptacle)	E (BCD)			N/A	N/A
30A switch interlocked	E (BCD)			CH No. APJ3385-S4	VT GB-1016-51SL GB-D1016-51SL GB-B1716-51PL GB-B1916-51PL GB-B1516-51PL

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table 2. Hazardous Area, Class I, Division 1, Group B, C, D Explosionproof Receptacles (cont)

120/208V, 60 Hz, 3 phase, 5 wire, 4 pole					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - RECEPTACLE	WIRING DIAGRAM - PLUG	WIRING DIAGRAM - GSE	RECEPTACLE
30A switch interlocked	E (BCD)				
60A switch interlocked	E (BCD)				
100A switch interlocked	E (BCD)				

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

** - OPERATING LEVER FOR SWITCH INTERLOCK

Table 2. Hazardous Area, Class I, Division 1, Group B, C, D Explosionproof Receptacles (cont)

120V, 60 Hz, single phase, 3 wire, 2 pole					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - RECEPTACLE	WIRING DIAGRAM - PLUG	WIRING DIAGRAM - GSE	RECEPTACLE
30A					N/A
			VT GB-B1716-51SL GB-B1916-51SL GB-B1516-51SL	VT GB-1016-51PL GB-D1016-51PL	
208V, 60 Hz, single phase, 3 wire, 2 pole					
30A switch interlocked	208V				N/A
			CH No. BHR3382N BHR3383N	CH No. BHP3383N BHP3385N	
480V, 60 Hz, 3 phase, 4 wire, 3 pole					
20A use, switch interlocked (30A actual manufacturer's rating)					N/A
			CH No. FSQC2430 FSQC3430	CH No. APJ3485	

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

** - OPERATING LEVER FOR SWITCH INTERLOCK

Table 2. Hazardous Area, Class I, Division 1, Group B, C, D Explosionproof Receptacles (cont)

		480V, 60 Hz, 3 phase, 4 wire, 3 pole (cont)				WIRING DIAGRAM - GSE	
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		PLUG	RECEPTACLE	WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG			RECEPTACLE	
30A switch interlocked	E (BCD)			ØB ØC G ØA	ØC ØB G ØA	ØC ØB G ØA	ØC ØB G ØA
60A switch interlocked	E (BCD)			ØA ØB ØC G	ØB ØA ØC G	ØC ØB G ØA	ØC ØB G ØA
100A switch interlocked	E (BCD)			ØA ØB ØC G	ØB ØA ØC G	ØC ØB G ØA	ØC ØB G ØA

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

** - OPERATING LEVER FOR SWITCH INTERLOCK

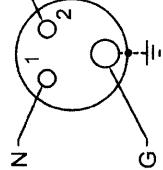
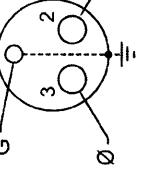
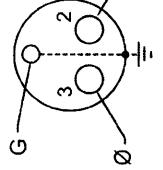
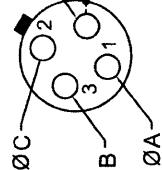
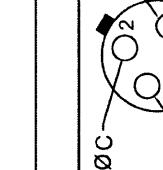
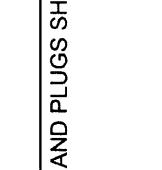
Table 2. Hazardous Area, Class I, Division 1, Group B, C, D Explosionproof Receptacles (cont)

480V, 60 Hz, 3 phase, 4 wire, 3 pole (cont)					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY RECEPTACLE	PLUG	WIRING DIAGRAM - GSE RECEPTACLE	
200A	E (BCD)				VT GB-B1728-31PL GB-B1928-31PL GB-B1528-31PL
30A switch interlocked	(3) 30 E (BCD)				CH No. BHP3583DW BHP3585DW

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

** - OPERATING LEVER FOR SWITCH INTERLOCK

Table 3. Hazardous Area, Class I, Division 1, Group C, D Explosionproof Receptacles

120V, 60 Hz, single phase, 3 wire, 2 pole					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY RECEPTACLE	WIRING DIAGRAM - PLUG	WIRING DIAGRAM - GSE RECEPTACLE	
20A				N/A	
		1RS No. 4464FC 1RS No. 4464SC	1RS No. 4466	N/A	
30A				N/A	
		2 RS No. 4233BC	2 RS No. 4237BC	N/A	
480V, 60 Hz, 3 phase, 4 wire, 3 pole					
30A use (60A actual manufacturer's rating)				N/A	
		CH No. FSQC5640-S4	CH No. APJ6485-S4	N/A	

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Note: ¹ Rated at 240V AC² Rated at 480V ACFC - FLAP COVER
SC - SCREW COVER

Table 3. Hazardous Area, Class I, Division 1, Group C, D Explosionproof Receptacles (cont)

		480V, 60 Hz, 3 phase, 4 wire, 3 pole (cont)		
RATING	FACILITY SYMBOL	WIRING DIAGRAM - RECEPTACLE	WIRING DIAGRAM - PLUG	WIRING DIAGRAM - GSE RECEPTACLE
60A	▲ (CD) E (D)			N/A
200A interlocked circuit breaker combination (Group D only)				N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

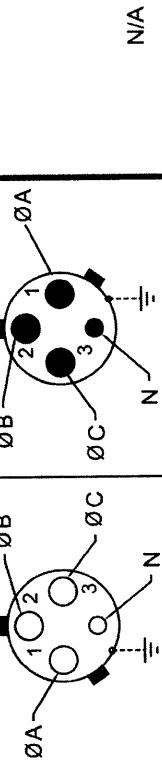
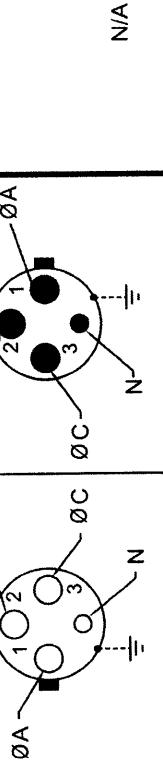
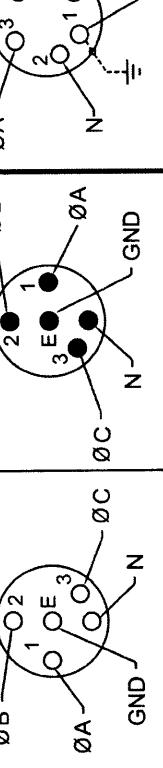
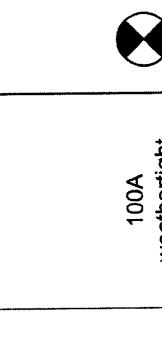
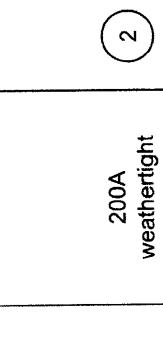
Table 4: Not to Be Utilized for New Design
[Nonhazardous Area (Indoor / Outdoor) Receptacles]

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	PLUG	RECEPTACLE
30A, weathertight				N/A	N/A
30A, weathertight				1 RS No. 3117W	N/A
60A weathertight				1 RS No. 3124W-78	N/A
				1 RS No. 3118W	N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Note: ¹ Rated at 480V AC

Table 4. Not to Be Utilized for New Design (cont)
[Nonhazardous Area (Indoor / Outdoor) Receptacles]

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY			WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	PLUG	RECEPTACLE	
100A weathertight	WT				N/A	N/A
200A weathertight	(2) WT				N/A	N/A
30A weathertight	WT				▲ RS No. 3MP516 ▲ RS No. 3F0516AB	CH RPC133-153-S02AR RPC133-389-S02AR RPC133-389-S02AR

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Note: ▲ Rated at 480V AC

▲ KEYING TO BE SET AT FACTORY BASED ON VOLTAGE ASSIGNMENT NUMBERS.
RECEPTACLES AND PLUGS HAVE NON-METALLIC SHELLS

Table 4. Not to Be Utilized for New Design (cont)
[Nonhazardous Area (Indoor / Outdoor) Receptacles]

120/208V, 60 Hz, 3 phase, 5 wire, 4 pole (cont)					
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY RECEPTACLE	WIRING DIAGRAM - PLUG	WIRING DIAGRAM - GSE RECEPTACLE	
60A weathertight	WT	 ▲ RS No. 6F0516AB	 ▲ RS No. 6MP516	 N/A	
100A		 ▲ RS No. 10F0516AB	 ▲ RS No. 10MP516	 N/A	
200A		 ▲ RS No. DS2516FRAB0	 ▲ RS No. DS2516MP000	 N/A	

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

▲ KEYING TO BE SET AT FACTORY BASED
ON VOLTAGE ASSIGNMENT NUMBERS.
RECEPTACLES AND PLUGS HAVE NON-
METALLIC SHELLS

Table 4. Not to Be Utilized for New Design (cont)
[Nonhazardous Area (Indoor / Outdoor) Receptacles]

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	PLUG	RECEPTACLE
30A weathertight 45° angle flap cover	■			N/A	N/A
60A weathertight 45° angle flap cover	▲			N/A	N/A
100A weathertight 45° angle flap cover	W			N/A	N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Note: 1 Rated at 600V AC

Table 4. Not to Be Utilized for New Design (cont)
 [Nonhazardous Area (Indoor / Outdoor) Receptacles]

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY			WIRING DIAGRAM - GSE RECEPTACLE
		RECEPTACLE	PLUG	PLUG	
100A weathertight 45° angle flap cover					N/A
200A weathertight 45° angle flap cover					N/A
200A weathertight 45° angle flap cover					N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN
 Note: 1 Rated at 600V AC

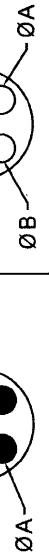
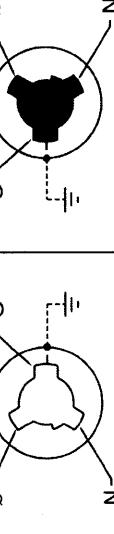
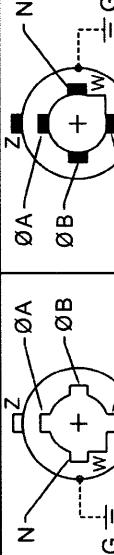
Table 4. Not to Be Utilized for New Design (cont)
[Nonhazardous Area (Indoor / Outdoor) Receptacles]

RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY			WIRING DIAGRAM - GSE	
		RECEPTACLE	PLUG	PLUG	RECEPTACLE	
200A weathertight 20° angle flap cover					N/A	N/A
200A weathertight 45° angle flap cover					N/A	N/A
400A weathertight					CH No. AP404610 AP404612 STYLE 2	N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Note: 1 Rated at 600V AC

Table 4. Not to Be Utilized for New Design (cont)
 [Nonhazardous Area (Indoor / Outdoor) Receptacles]

		480V, 60 Hz, 3 phase, 4 wire, 3 pole (cont)			WIRING DIAGRAM - GSE	
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY RECEPTACLE	PLUG	PLUG	WIRING DIAGRAM - GSE RECEPTACLE	
400A weatherlight		CH No. AREX4042210 AREX4042212 STYLE 2 (SUFFIX S22)		CH No. AP404610 AP404612 STYLE 2 (SUFFIX S22)	N/A	
20A		1 HU No. HBL23000G AH23000G		1 HU No. HBL23005GB AH23005N	N/A	
30A		2 HU No. HBL25403 AH25403		2 HU No. HBL25415B AH25415N	N/A	

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Note: ¹Rated at 480V AC
²Rated at 600V AC

Table 4. Not to Be Utilized for New Design (cont)
[Nonhazardous Area (Indoor / Outdoor) Receptacles]

		208V, 60 Hz, single phase, 3 wire, 2 pole			
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
	RECEPTACLE	PLUG		PLUG	RECEPTACLE
30A					
[Hazardous Area, Class I, Division 1, Group B, C, D Explosionproof Receptacles]					
		208V, 60 Hz, single phase, 3 wire, 2 pole			
RATING	FACILITY SYMBOL	WIRING DIAGRAM - FACILITY		WIRING DIAGRAM - GSE	
	RECEPTACLE	PLUG		PLUG	RECEPTACLE
30A	208V E (BCD)				N/A

FACE VIEW OF RECEPTACLES AND PLUGS SHOWN

Table 5. Receptacle/Plug Cross-Reference Chart
(Meltric replacements for the Russellstoll R&S Series listed which has been discontinued)

R&S	MELTRIC
3F0516AB	33-30167-MA3
3MP516	33-31167
6F0516AB	33-60167-MA6
6MP516	33-61167
10F0516AB	33-90167-MA10
10MP516	33-91167

NOTE

The Meltric plugs and receptacles listed above shall only be used to mate existing Russellstoll plugs/receptacles listed which are no longer available as the R&S series.

January 7, 2009

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER KSC-STD-E-0011	2. DOCUMENT DATE December 2, 2008						
3. DOCUMENT TITLE Electrical Power Receptacles and Plugs, Standard for								
4. NATURE OF CHANGE (<i>Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.</i>)								
5. REASON FOR RECOMMENDATION								
6. SUBMITTER <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">a. NAME (<i>Last, First, Middle Initial</i>)</td> <td style="width: 50%; padding: 5px;">b. ORGANIZATION</td> </tr> <tr> <td style="padding: 5px;">c. ADDRESS (<i>Include Zip Code</i>)</td> <td style="padding: 5px;">d. TELEPHONE (<i>Include Area Code</i>)</td> </tr> <tr> <td colspan="2" style="padding: 5px; text-align: right;">7. DATE SUBMITTED</td> </tr> </table>			a. NAME (<i>Last, First, Middle Initial</i>)	b. ORGANIZATION	c. ADDRESS (<i>Include Zip Code</i>)	d. TELEPHONE (<i>Include Area Code</i>)	7. DATE SUBMITTED	
a. NAME (<i>Last, First, Middle Initial</i>)	b. ORGANIZATION							
c. ADDRESS (<i>Include Zip Code</i>)	d. TELEPHONE (<i>Include Area Code</i>)							
7. DATE SUBMITTED								
8. PREPARING ACTIVITY <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">a. NAME Chief, Mechanical/Electrical Branch</td> <td style="width: 50%; padding: 5px;">d. TELEPHONE (<i>Include Area Code</i>) (321) 867-4002</td> </tr> <tr> <td colspan="2" style="padding: 5px;"> c. ADDRESS (<i>Include Zip Code</i>) National Aeronautics and Space Administration Mail Code: TA-B3 Kennedy Space Center, FL 32899 </td> </tr> </table>			a. NAME Chief, Mechanical/Electrical Branch	d. TELEPHONE (<i>Include Area Code</i>) (321) 867-4002	c. ADDRESS (<i>Include Zip Code</i>) National Aeronautics and Space Administration Mail Code: TA-B3 Kennedy Space Center, FL 32899			
a. NAME Chief, Mechanical/Electrical Branch	d. TELEPHONE (<i>Include Area Code</i>) (321) 867-4002							
c. ADDRESS (<i>Include Zip Code</i>) National Aeronautics and Space Administration Mail Code: TA-B3 Kennedy Space Center, FL 32899								

